



Australian Bureau of Statistics

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Summary

About this Release

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The availability of Business Activity Statement (BAS) data collected by the Australian Taxation Office (ATO) has provided the Australian Bureau of Statistics (ABS) with opportunities to improve the efficiency of sample designs and estimations for its business surveys. ABS business surveys currently use two methods of estimation; number-raised estimation and ratio estimation. While ratio estimation allows the use of one auxiliary variable to improve the precision of the estimates, generalised regression (GREG) estimation allows the use of more than one auxiliary variable, and hence has the potential to be more efficient (i.e. reduce the current sample sizes for ABS business surveys with no reduction in the accuracy of the estimates) than number-raised and ratio estimation.

In order to realise these efficiencies, it will be necessary to develop a methodology that will produce generalised regression estimates and measures of accuracy of these generalised regression estimates for a variety of statistics under various sample designs; including:

- single phase point-in-time estimates of level
- single phase movement estimates of level
- single phase point-in-time estimates of rates
- single phase movement estimates of rates
- two phase point-in-time estimates of level
- two phase movement estimates of level
- two phase point-in-time estimates of rates
- two phase movement estimates of rates

It will also be necessary to develop a computer system that will produce generalised regression estimates and measures of accuracy of these generalised regression estimates. There are several characteristics that would be required in this computing system, and the underlying methodology. Firstly, the computer system needs to be generic. This means that the algorithm for variance estimation is the same irrespective of the corresponding statistics. This simplifies the maintenance and development of the computing system. Secondly, the computer system needs to minimise the computation costs. These include the storage costs (e.g. the replicate weights in the case of the replicate variance estimators) and the time the computing system takes to calculate the variance estimators. Thirdly, the methodology needs to have desirable theoretical properties, such as unbiasedness. Fourthly, the methodology needs to have good empirical properties for typical ABS sample designs. This includes information about the bias and variance of the method that can be measured in

simulation studies.

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